Remarks:

Claims 42-48 and 50-93 are now pending in this application. Applicants have not amended the claims. Applicants respectfully request favorable reconsideration of this application.

The Examiner rejected claim 42 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent 6,906,434 to Koeppe et al. in view of U.S. patent 6,680,602 to Iyoda et al. The Examiner rejected claims 42-46, 48, 50, 58, 66-74, 77-80, 83-87, and 90-93 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view of U.S. patent 6,924,565 to Wilkins et al. The Examiner rejected claims 83-87 and 90-93 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view of U.S. patent 6,906,434 to Vithayathil et al. The Examiner rejected claim 82 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view Wilkins et al. and further in view of U.S. patent 6,925,385 to Ghosh et al. The Examiner rejected claims 47, 75, and 88 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view Wilkins et al. and further in view of U.S. patent 6,577,108 to Hubert et al. The Examiner rejected claims 49 and 60 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view Wilkins et al. and further in view of U.S. patent 4,081,741 to Palmer. The Examiner rejected claims 51 and 52 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view Wilkins et al. and further in view of U.S. patent 5,166,597 to Larsen et al. The Examiner rejected claims 53 and 54 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view Wilkins et al. and further in view of U.S. patent 6,011,381 to Andrei. The Examiner rejected claims 55 and 57 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in

view Wilkins et al. and further in view of U.S. patent publication 2004/0012472 to Sasse et al. The Examiner rejected claim 56 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view Wilkins et al. and further in view of U.S. patent 4,591,963 to Retotar. The Examiner rejected claims 59 and 76 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view Wilkins et al. and further in view of U.S. patent 4,075,675 to Buckett et al. The Examiner rejected claims 64, 65, and 89 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view Wilkins et al. and further in view of Watson et al. The Examiner rejected claims 61-63 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Koeppe et al. and Wilkins et al. The Examiner rejected claim 88 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view of Vithayathil et al. and further in view of Hubert et al. The Examiner rejected claim 89 under 35 U.S.C. § 103(a) as being unpatentable over Koeppe et al. in view of Vithayathil et al. and further in view of Watson et al.

The combination of Koeppe et al. and Iyoda et al. does not suggest the invention recited in claim 42 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers. Additionally, the combination does not suggest a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized. Furthermore, the combination does not suggest two shunt-connected transformers that are controlled in a coordinated manner.

Rather, Koeppe et al. suggests a voltage recovery device which stabilizes the voltage on a utility power system or network by reducing during a fault recovery period the overall real and

reactive power losses of the utility power system, as discussed at paragraph [0017]. On the other hand, the invention recited in claim 42 relates to normal operating conditions of a power transmission system, where power losses due to effects of reactive charging losses as well as resistive and dielectric losses are minimized, as described at page 1, first paragraph.

The Examiner asserts that the voltage control member 60 suggested by Koeppe et al. is operatively connected to transformers 22a and 22b. However, at paragraph [0045], Koeppe et al. describes the system illustrated in Fig. 4, as including a distribution line 20 that is connected on one end via transformer 22a to a transmission line 18 and on the other end via transformer 22b to a load 24. As described in paragraphs [0054] and [0044], a distributed superconducting magnetic energy storage module 30, also called a voltage recovery device 30, is connected in shunt with the distribution line 20, where module 30 is capable of delivering both real and reactive power.

The actual source for both real and reactive power is inverter system 44, which is part of the module 30, as described in paragraph [0048]. Inverter system 44 is coupled to distribution line 20 through step-down transformers 50 and switchgear units 52, as described in paragraph [0052], **and not through transformers 22a and/or 22b**. System control unit 60 processes inputs from distribution line 20 and from inverter system 44, and determines dynamically the output values for inverter system 44 (phase and magnitude of inverter units 46), as described in paragraph [0054].

Accordingly, control unit 60 is **operatively connected** via inverter system 44 to step-

down transformer 50, which is arranged somewhere **in-between** the two ends of distribution line 20. As a result, control unit 60 does not control transformers 22a and/or 22b. As a result, control unit 60 thereby cannot control the transformers so that losses due to reactive power transport are minimized. Additionally, Keoppe et al. does not suggest a tap-changer operatively connected to a voltage control member and to one of two transformers.

Iyoda et al. does not suggest that voltage control member 1 or 10 is operative to control transformer 17. Additionally, Iyoda et al. does not suggest that the tap-changer 17a is operatively connected to voltage control member 1 or 10 to vary the voltage transformation of the transformer 17. Rather, Iyoda et al. suggests two separate voltage regulators, one being a slow-response tap-changing transformer 17 and the other a quick-response reactive power compensator 1. Iyoda et al. suggests utilizing the two separate voltage regulators for voltage stabilization of a system, as described in the abstract.

Iyoda et al. suggests providing the tap-changing transformer 17 with a tap control 17a, that is, a tap changer, which operates in a known manner and which is obviously independent of the reactive power compensator, as described in paragraphs [0018]-[0023] and shown in Figs. 9 and 10. In paragraph [0024] Iyoda et al. further describes, what happens when the reactive power compensator 20 is connected in addition to the tap-changing transformer 17 and the tap changer 17a. Iyoda et al. does not include any description of operatively connecting the tap changer 17a to the reactive power compensator 20 in order to vary the voltage transformation of transformer 17. Rather, Iyoda et al. suggests that the adjustment of the voltage of transformer 17 is carried out by the tap changer 17a alone.

As Iyoda et al. shows in Fig. 1 and as described in paragraphs [0063] and [0065], the only connection between the tap changer 17a and the reactive compensator is a signal line 6 from the tap changer 17a to the reactive power compensator 1 delivering so called set values Vref, Vmax and Vmin.

Additionally, in the embodiment shown in Fig. 4, Iyoda et al. even omits the signal line 6 and replaces the signal line with a second computing unit 13 estimating the set values. As a result, no connection at all exists between the tap-changing transformer 17, the tap changer 17a and the reactive power compensator 10. Furthermore, Iyoda et al. does not suggest two shunt connected transformers with one at each end of the transmission line. Rather, Iyoda et al. only suggests one shunt connected transformer. Still further, Iyoda et al. does not suggest an operative connection between a tap-changer and a voltage control member to vary a voltage transformation of the transformer, where the voltage control member is simultaneously operatively connected to the transformer(s).

As a result, even if Koeppe et al. and Iyoda et al. were combined, the combination would not suggest two shunt-connected transformers, one at each end of a transmission line, or a tap changer which is operatively connected to one of the transformers, wherein the two transformer and the tap changer are all controlled in a coordinated manner by **one** voltage control member.

In view of the above, the combination of Koeppe et al. and Iyoda et al. does not suggest the invention recited in claim 42. Accordingly, the invention recited in claim 42 is not obvious

in view of the combination of Koeppe et al. and Iyoda et al. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al. and Wilkins et al. does not suggest the invention recited in claims 42-46, 48, 50, 58, 61-63, 66-74, 77-80, 83-87, and 90-93 since, among other things, Wilkins et al. does not overcome the above-discussed deficiencies of Koeppe et al. Along these lines, Wilkins does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. Wilkins et al. does not even suggest two transformers.

In view of the above, the combination of Koeppe et al. and Wilkins et al. does not suggest the invention recited in claims 42-46, 48, 50, 58, 61-63, 66-74, 77-80, 83-87, and 90-93. Accordingly, the invention recited in claims 42-46, 48, 50, 58, 61-63, 66-74, 77-80, 83-87, and 90-93 is not obvious in view of the combination of Koeppe et al. and Wilkins et al. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al. and Vithayathil et al. does not suggest the invention recited in claims 83-87 and 90-93 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers. Additionally, the combination does not suggest a voltage control member that

controls the two shunt-connected transformers so that losses due to reactive power transport are minimized. Furthermore, the combination does not suggest two shunt-connected transformers that are controlled in a coordinated manner.

Vithayathil suggests a device 10 for rapid adjustment of a network impedance not voltage. The device is connected via a series-transformer 12 not a shunt-transformer to the line, as described in the abstract and as shown in Fig. 1b. Additionally, neither Koeppe et al. nor Vithayathil suggests regulating a operating voltage of an AC transmission cable dependent on a surge impedance of a cable as recited in claims 83 and 92.

In view of the above, the combination of Koeppe et al. and Vithayathil does not suggest the invention recited in claims 83-87 and 90-93. Accordingly, the invention recited in claims 83-87 and 90-93 is not obvious in view of the combination of Koeppe et al. and Vithayathil. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Wilkins et al. and Ghosh et al. does not suggest the invention recited in claim 82 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Ghosh et al. as suggesting a graphical user interface. A graphical user interface does not suggest the elements of the invention not

suggested by Koeppe et al. or Wilkins et al.

Accordingly, the combination of Koeppe et al., Wilkins et al. and Ghosh et al. does not suggest the invention recited in claim 82. Accordingly, the invention recited in claim 82 is not obvious in view of the combination of Koeppe et al., Wilkins et al. and Ghosh et al. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Wilkins et al. and Hubert et al. does not suggest the invention recited in claims 47, 75, and 88 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Hubert et al. as suggesting a control member arranged with control instructions of operation of an AC transmission cable under thermal overload conditions during limited periods of time. A control member arranged with control instructions of operation of an AC transmission cable under thermal overload conditions during limited periods of time does not suggest the elements of the invention not suggested by Koeppe et al. or Wilkins et al.

Accordingly, the combination of Koeppe et al., Wilkins et al. and Hubert et al. does not suggest the invention recited in claims 47, 75, and 88. Accordingly, the invention recited in claims 47, 75, and 88 is not obvious in view of the combination of Koeppe et al., Wilkins et al.

and Hubert et al. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Wilkins et al. and Palmer does not suggest the invention recited in claims 49 and 60 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Palmer as suggesting a tap changer or one or more tap changer by-pass connectors. A tap changer or one or more tap changer by-pass connectors does not suggest the elements of the invention not suggested by Koeppe et al. or Wilkins et al.

Accordingly, the combination of Koeppe et al., Wilkins et al. and Palmer does not suggest the invention recited in claims 49 and 60. Accordingly, the invention recited in claims 49 and 60 is not obvious in view of the combination of Koeppe et al., Wilkins et al. and Palmer. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Wilkins et al. and Larsen et al. does not suggest the invention recited in claims 51 and 52 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that

are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Larsen et al. as suggesting a mechanical tap changer/phase shifting tap changer. A mechanical tap changer/phase shifting tap changer does not suggest the elements of the invention not suggested by Koeppe et al. or Wilkins et al.

Accordingly, the combination of Koeppe et al., Wilkins et al. and Larsen et al. does not suggest the invention recited in claims 51 and 52. Accordingly, the invention recited in claims 51 and 52 is not obvious in view of the combination of Koeppe et al., Wilkins et al. and Larsen et al. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Wilkins et al. and Andrei does not suggest the invention recited in claims 53 and 54 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Andrei as suggesting an auto transformer. An auto transformer does not suggest the elements of the invention not suggested by Koeppe et al. or Wilkins et al.

Accordingly, the combination of Koeppe et al., Wilkins et al. and Andrei does not suggest the invention recited in claims 53 and 54. Accordingly, the invention recited in claims

53 and 54 is not obvious in view of the combination of Koeppe et al., Wilkins et al. and Andrei. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Wilkins et al. and Sasse et al. does not suggest the invention recited in claims 55 and 57 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Sasse et al. as suggesting a transformer arranged to limit short circuit currents. A transformer arranged to limit short circuit currents does not suggest the elements of the invention not suggested by Koeppe et al. or Wilkins et al.

Accordingly, the combination of Koeppe et al., Wilkins et al. and Sasse et al. does not suggest the invention recited in claims 55 and 57. Accordingly, the invention recited in claims 55 and 57 is not obvious in view of the combination of Koeppe et al., Wilkins et al. and Sasse et al. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Wilkins et al. and Retotar does not suggest the invention recited in claim 56 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to

reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Retotar as suggesting a high frequency filter. A high frequency filter does not suggest the elements of the invention not suggested by Koeppe et al. or Wilkins et al.

Accordingly, the combination of Koeppe et al., Wilkins et al. and Retotar does not suggest the invention recited in claim 56. Accordingly, the invention recited in claim 56 is not obvious in view of the combination of Koeppe et al., Wilkins et al. and Retotar. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Wilkins et al. and Buckett et al. does not suggest the invention recited in claims 59 and 76 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Buckett et al. as suggesting one or more breakers arranged for rapid disconnect and reconnect. One or more breakers arranged for rapid disconnect and reconnect does not suggest the elements of the invention not suggested by Koeppe et al. or Wilkins et al.

Accordingly, the combination of Koeppe et al., Wilkins et al. and Buckett et al. does not

suggest the invention recited in claims 59 and 76. Accordingly, the invention recited in claims 59 and 76 is not obvious in view of the combination of Koeppe et al., Wilkins et al. and Buckett et al. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Wilkins et al. and Watson et al. does not suggest the invention recited in claims 64, 65, and 89 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Watson et al. as suggesting a cable system shield that includes transposings and sheath sectionalizing insulators reducing shield induced currents. A cable system shield that includes transposings and sheath sectionalizing insulators reducing shield induced currents does not suggest the elements of the invention not suggested by Koeppe et al. or Wilkins et al.

Accordingly, the combination of Koeppe et al., Wilkins et al. and Watson et al. does not suggest the invention recited in claims 64, 65, and 89. Accordingly, the invention recited in claims 64, 65, and 89 is not obvious in view of the combination of Koeppe et al., Wilkins et al. and Watson et al. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Vithayathil et al. and Hubert et al. does not suggest the invention recited in claim 88 since, among other things, the combination does not suggest an

operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Hubert et al. as suggesting a control member arranged with control instructions for operation of an AC transmission cable under thermal overload conditions during limited periods of time. A control member arranged with control instructions for operation of an AC transmission cable under thermal overload conditions during limited periods of time does not suggest the elements of the invention not suggested by Koeppe et al. or Vithayathil et al.

Accordingly, the combination of Koeppe et al., Vithayathil et al. and Hubert et al. does not suggest the invention recited in claim 88. Accordingly, the invention recited in claim 88 is not obvious in view of the combination of Koeppe et al., Vithayathil and Hubert et al. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Koeppe et al., Vithayathil et al. and Watson et al. does not suggest the invention recited in claim 89 since, among other things, the combination does not suggest an operative connection between a voltage control member and two shunt-connected transformers, a voltage control member that controls the two shunt-connected transformers so that losses due to reactive power transport are minimized, two shunt-connected transformers that are controlled in a coordinated manner, or a tap-changer operatively connected to a voltage control member and to one of two transformers. The Examiner only cites Watson et al. as suggesting a cable shielding

system that includes transposings and sheath sectionalizing insulators reducing shield induced currents. A cable shielding system that includes transposings and sheath sectionalizing insulators reducing shield induced currents does not suggest the elements of the invention not suggested by Koeppe et al. or Vithayathil et al.

Accordingly, the combination of Koeppe et al., Vithayathil et al. and Watson et al. does not suggest the invention recited in claim 89. Accordingly, the invention recited in claim 89 is not obvious in view of the combination of Koeppe et al., Vithayathil and Watson et al. Therefore, Applicants respectfully request withdrawal of this rejection.

In view of the above, the references relied upon in the office action, whether considered alone or in combination, do not suggest patentable features of the claimed invention. Therefore, the references relied upon in the office action, whether considered alone or in combination, do not make the claimed invention obvious. Accordingly, Applicants submit that the claimed invention is patentable over the cited references.

If an interview would advance the prosecution of this application, Applicants respectfully urge the Examiner to contact the undersigned at the telephone number listed below.

The undersigned authorizes the Commissioner to charge insufficient fees and credit overpayment associated with this communication to Deposit Account No. 22-0261.

Respectfully submitted,

Date: March 23, 2009

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